Abstract

A method for the orientation of a sperm cell to determine cell differences due to size, mass, or density is used to distinguish X chromosome-bearing sperm cells from Y chromosome-bearing sperm cells and therefore have use in in-vitro and in-vivo fertilization procedures. The orientation of individual sperm cells is determined by measuring non-fluorescent light. The method uses one detector to measure the magnitude of fluorescence (for DNA (sex) measurement from the flat surface of the spermatozoon), and a second detector to measure the magnitude of refracted non-fluorescent light derived from a separate light source. The separate light source is derived from part of a phase contrast or Dark field optical system to provide orientation data. Importantly, all excitation and fluorescent light is excluded from the second detection system by band-pass optical filters thereby providing for a cleaner signal from the concave edge (no fluorescence signal from the flat surfaces of the spermatozoon).